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DRAFT CLAIMS - FMC 1661 PUS

1. A reduced radius hem assembly comprising:
an inner panel having an outwardly extending perimeter flange comprising an end surface disposed in a first plane, an inboard surface lying in a second plane perpendicular to the end surface, and a beveled surface located between the end surface and the inboard surface, the beveled surface being disposed inboard of the intersection of the first and second planes; and
an outer panel having a peripheral edge comprising a bend portion, an intermediate portion, and an end portion wherein the intermediate portion is adjacent to the beveled surface of the perimeter flange and the end portion overlies a portion of the inboard surface of the perimeter flange.
2. The reduced radius hem assembly of claim 1 wherein the thickness of the inner panel is greater than the thickness of the outer panel.
3. The reduced radius hem assembly of claim 1 wherein the inner panel comprises a magnesium composite material.
4. The reduced radius hem assembly of claim 1 wherein the perimeter flange of the inner panel is provided with the beveled surface that extends across a portion of the perimeter flange.

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5. The reduced radius hem assembly of claim 4 wherein the hem assembly includes areas that define cut lines and wherein the beveled surface is provided in the areas defining cut lines.

6. The reduced radius hem assembly of claim 4 wherein the hem assembly includes areas that define surface curvature and wherein the beveled surface is provided in the areas defining surface curvature.

7. A method of hemming an outer metal panel having a peripheral edge to an inner metal panel having a perimeter flange, the method comprising:

removing a top corner of the perimeter flange of the inner panel to form a beveled surface across a portion of the perimeter flange;

assembling the inner panel and the outer panel together;

forming the peripheral edge in a pre-hem pass with a hemming tool to bend the peripheral edge adjacent to the perimeter flange of the inner panel in a spaced relationship relative to the beveled surface; and

forming the peripheral edge of the outer panel into engagement with a portion of an inboard surface of the perimeter flange of the inner panel.

8. The method of claim 7, wherein the removing of a top corner of the perimeter flange of the inner panel comprises a deburring process.

9. A reduced radius hem for an inner and outer panel, the inner panel having an outwardly extending peripheral flange having a nominal thickness, the peripheral flange comprising an

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end surface that has a height that is less than the nominal thickness, an inboard surface that is perpendicular to the end surface, and a beveled surface located between the end surface and the inboard surface, the beveled surface disposed in a plane that is recessed relative to the end surface and of the inboard surface, the outer panel having a peripheral edge comprising a bend portion, an intermediate portion, and an end portion whereby the beveled surface provides clearance for bending the peripheral edge of the outer panel over the inner panel.

10. The method of claim 7, wherein the removing of a top corner of the perimeter flange of the inner panel comprises a grinding process.

11. The method of claim 7, wherein the removing of a top corner of the perimeter flange of the inner panel to form a beveled surface across a portion of the perimeter flange is achieved by molding.

12. The method of claim 7, wherein the hemming tool is a roller.

13. A method of claim 7, wherein the beveled surface is oriented at approximately a 45° angle relative to the inboard surface.

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14. A method of hemming an outer metal panel having a peripheral edge extending generally perpendicularly relative to the body of the outer panel and an inner metal panel having a perimeter flange together, the method comprising:

removing a top corner of the perimeter flange of the inner panel whereby a beveled surface is formed;

placing the inner panel and outer panel together;

rolling the peripheral edge in a first pre-hem pass to bend the peripheral edge to an acute angle relative to the body of the outer panel and spaced relative to the beveled surface;

rolling the peripheral edge in a second pre-hem pass to bend the peripheral edge to a second acute angle relative to the body of the outer panel; and

rolling the peripheral edge of the outer panel in a final pass over and into engagement with a perimeter flange of the inner panel.